

Work Order ID 51377

August 20, 2009 1:46:48 PM



Item ID: D212-664-207TRN

Accept



Setup Start



Revision ID: A

Stop



Item Name: Crosstube Turning Detail

Start Date: 8/20/09 Start Qty: 1.00



Cust Item ID:

Required Date: 8/25/09 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: *CL*

Date: *9/10/20*

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Draw Number | Draw Rev. | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--------------------------------|--|----------------------|----------------|--------------|--------------|---------------|---------------|------------------|----------------|
| Draw Nbr | Revision Nbr | | | | | | | | |
| D212-664-247 | Rev A | | | | | | | | |
| 100 | | 0.00 | | | | | | | |
| | MORI SEIKI CNC LATHE LARGE | | | | | | | | |
| Mori Seiki | Memo | 0.00 | | | | | | | |
| Mori Seiki CNC Lathe Large | 1-Fill tube with sand & install plugs DT8534 on both ends as per Folio FA706112-Turn first side as per Folio FA706113- File transition lines smooth. | | | | | | | | |
| 110 | | 0.00 | | | | | | | |
| | QC1- Inspect dimensions to dimension sheet | | | | | | | | |
| QC | Memo | 0.00 | | | | | | | |
| Quality Control | | | | | | | | | |
| 120 | | 0.00 | | | | | | | |
| | MORI SEIKI CNC LATHE LARGE | | | | | | | | |
| Mori Seiki | Memo | 0.00 | | | | | | | |
| Mori Seiki CNC Lathe Large | 1-Turn second side as per Folio FA706112- File transition lines smooth.113- Remove sand and plugs | | | | | | | | |

A.M 09-08-270

A.M 09-08-270

A.M 09-08-270

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
| | | | | | | | |
| | | | | | | | |

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

NOTE: Date & initial all entries

Work Order ID 51377

August 20, 2009 1:46:48 PM

Page 2

Item ID: D212-664-207TRN

Accept

Revision ID: A

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Required Date: 8/25/09 Req'd Qty: 1.00

Cust Item ID:

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Run

Start

Stop

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

130

QC1- Inspect dimensions to dimension sheet

0.00



QC

Memo

0.00

Quality Control

0.01 09 - 08 - 27 0

140

QC8- Inspect parts - second check

0.00



QC

Memo

0.00

Quality Control

1 0 - AWM 9-8-31

150

Crosstubes Chemical Conversion

0.00



HandFXtube

Memo

0.00

Hand Finishing Crosstubes

1 0 - AWM 9-8-31

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
| | | | | | | | |
| | | | | | | | |

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
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| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
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NOTE: Date & initial all entries

Work Order ID 51377

August 20, 2009 1:46:48 PM



Page 3

Item ID: D212-664-207TRN

Accept



Setup Start



Revision ID: A

Stop



Item Name: Crosstube Turning Detail

Start Date: 8/20/09 Start Qty: 1.00



Cust Item ID:

Required Date: 8/25/09 Req'd Qty: 1.00



Customer:

Reference:

Run Start



Approvals: Process Plan: Date: Tooling: Date:

Stop



QC: Date: SPC (Y/N): Date:

| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Draw Number | Draw Rev. | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--------------------------------|--------------------------|----------------------|----------------|--------------|--------------|---------------|---------------|------------------|----------------|
|--------------------------------|--------------------------|----------------------|----------------|--------------|--------------|---------------|---------------|------------------|----------------|

| | | | | | | | | | |
|-----|--------------------------|------|--|--|--|--|--|--|--|
| 160 | QC3- Inspect Part Finish | 0.00 | | | | | | | |
|-----|--------------------------|------|--|--|--|--|--|--|--|



| | | | | | | | | | |
|----|------|------|--|--|--|--|--|--|--|
| QC | Memo | 0.00 | | | | | | | |
|----|------|------|--|--|--|--|--|--|--|

Quality Control

0.11 09-09-01 (2)

| | | | | | | | | | |
|-----|-----------|------|--|--|--|--|--|--|--|
| 170 | Packaging | 0.00 | | | | | | | |
|-----|-----------|------|--|--|--|--|--|--|--|



| | | | | | | | | | |
|-----------|------|------|--|--|--|--|--|--|--|
| Packaging | Memo | 0.00 | | | | | | | |
|-----------|------|------|--|--|--|--|--|--|--|

Packaging

Identify and stock in kanban rack Location: X-TUBE CELL

1 X - AWM95-3

| | | | | | | | | | |
|-----|---|------|--|--|--|--|--|--|--|
| 180 | QC21- Final Inspection - Work Order Release | 0.00 | | | | | | | |
|-----|---|------|--|--|--|--|--|--|--|



| | | | | | | | | | |
|----|------|------|--|--|--|--|--|--|--|
| QC | Memo | 0.00 | | | | | | | |
|----|------|------|--|--|--|--|--|--|--|

Quality Control

09/09/01 (2)

MF 09-09-01

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
| | | | | | | | |
| | | | | | | | |

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
| | | | | | | | | |
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| | | | | | | | | |

NOTE: Date & initial all entries

Picklist Print

August 20, 2009 1:46:48 PM

Page 1

Work Order ID: 51377

Parent Item: D212-664-207TRNRevA

Parent Item Name: Crosstube Turning Detail

Start Date: 8/20/09

Required Date: 8/25/09

Comments:

Start Qty: 1.00

Required Qty: 1.00

| Component Item ID/ Item Name | Replacement Item ID | Mfg/ Purch | Bin Item | Primary Location | Last Location | Route Seq ID | Unit of Measure | Qty on Hand | Remaining Qty To Pick | Qty Issued | Date Issued | Status |
|---------------------------------|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|--------------------------|---------------|----------------|--------|
| D6008-132RevA | | Manufactured | No | | | 110 | Each | 3.0000 | 1.0000 | | | |



Crosstube extrusion

A. A. 07.08.27

Warehouse Loc Qty Loc Code

Location

Main Warehouse

LG

3

38340

3

1

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
| | | | | | | | |
| | | | | | | | |

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

NOTE: Date & initial all entries

| | | |
|--|---------------------|--------------|
| DART AEROSPACE LTD | Work Order: | 51377 |
| Description: Crosstube Assembly (205/212 Low Aft) | Part Number: | D212-664-247 |
| Inspection Dwg: D212-664-247 Rev: A | | Page 1 of 1 |

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

| Inspection Sheet | Drawing Dimension | Tolerance | Actual Dimension | Accept | Reject | Method of Inspection | Comments |
|------------------|-------------------|---------------|------------------|--------|--------|----------------------|----------|
| SIDE A | 0.438 | +/-0.010 | 0.438 | / | | | |
| | 2.680 | +0.005/-0.000 | 2.682 | / | | | |
| | 2.680 | +0.005/-0.000 | 2.684 | / | | | |
| | 2.687 | +0.005/-0.000 | 2.691 | / | | | |
| | 2.802 | +0.005/-0.000 | 2.804 | / | | | |
| | 2.906 | +0.005/-0.000 | 2.909 | / | | | |
| | 3.009 | +0.005/-0.000 | 3.004 | / | | | |
| | 3.112 | +0.005/-0.000 | 3.116 | / | | | |
| | 3.250 | +0.005/-0.000 | 3.250 | / | | | |
| | | | | | | | |
| SIDE B | 0.438 | +/-0.010 | 0.438 | / | | | |
| | 2.680 | +0.005/-0.000 | 2.682 | / | | | |
| | 2.680 | +0.005/-0.000 | 2.684 | / | | | |
| | 2.687 | +0.005/-0.000 | 2.691 | / | | | |
| | 2.802 | +0.005/-0.000 | 2.806 | / | | | |
| | 2.906 | +0.005/-0.000 | 2.909 | / | | | |
| | 3.009 | +0.005/-0.000 | 3.004 | / | | | |
| | 3.112 | +0.005/-0.000 | 3.116 | / | | | |
| | 3.250 | +0.005/-0.000 | 3.250 | / | | | |
| | | | | | | | |
| | 128.27 | +/-0.030 | 128.300 | / | | | |

| | | | | | |
|---------------------|-------------|------------------------------|-------------------|----------------------------|-----|
| Measured by: | A. N | Audited by: | AWM | Prototype Approval: | N/A |
| Date: | 08-08-27 | Date: | 9-8-3 | Date: | N/A |
| Rev | Date | Change | Revised by | Approved | |
| A | 08.11.07 | New Issue (P/O D212-664-207) | KJ/EC | | |

C269108/20
W10: 5/377

PARTS LIST:

| Qty | Part Number | Description |
|-----|-------------------|---|
| X | D212-664-247 | CROSSTUBE ASSEMBLY (205/212 LOW AFT) |
| 1 | D6008-132 | CROSSTUBE |
| 2 | D2940-1 | SUPPORT |
| 4 | D3595-063-530 | RUBBER CUSHION |
| 2 | D3660-1 | CUFF |
| 4 | MS21920-28 | CLAMP (OR MS21920-30) |
| 44 | CR3212-4-06 | RIVET (OR M7885/3-4-06) |
| A/R | MAGNOBOND 6398 | ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE) |
| A/R | SIKAFLEX-241/-291 | SEALANT (OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT) |

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6008-132
FINISHED LENGTH = 128.27 ± 0.020 (BEFORE BENDING/TRIMMING)
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) ALL DIMENSIONS ARE IN INCHES
- 5) PART IS SYMMETRIC ABOUT CENTERLINE.
- 6) WHEN MACHINING TAPER, RUN-OFF PART AT STOCK. BLEND OUT EDGE LONGITUDINALLY.
TRANSITION SHOULD BE SMOOTH.
- 7) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE
TO BENDING IS 6% BASED ON O.D., EXCEPT UP TO 10% IS ALLOWED IN AREA NOTED.
- 8) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 9) SCRIBE DART PART NUMBER AND BATCH NUMBER ON INNER SURFACE OF TUBE WITH A
VIBRATING STYLUS.
- 10) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 11) APPLY A 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1
THAT WILL BE IN CONTACT WITH THE CROSSTUBE. LET CURE FOR 12 HOURS AFTER
INSTALLATION AND PRIOR TO PACKAGING.
- 12) INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE
D2940-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE
CROSSTUBE SUPPORT.
- 13) TORQUE CLAMPS 80 TO 100 IN.-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY
AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.
- 14) INSTALL D3660-1 CUFF AFTER CHEMICAL CONVERSION COAT BUT BEFORE PAINT, WITH A
LAYER OF SIKAFLEX-241/-291 OR PROSEAL 890 OR MIL-S-8802 CLASS B2 SEALANT BETWEEN
CUFF AND CROSSTUBE. SEAL EDGE OF CUFF TO ENSURE NO GAPS.
- 15) TOUCH-UP HOLES WITH CHEMICAL CONVERSION COAT.

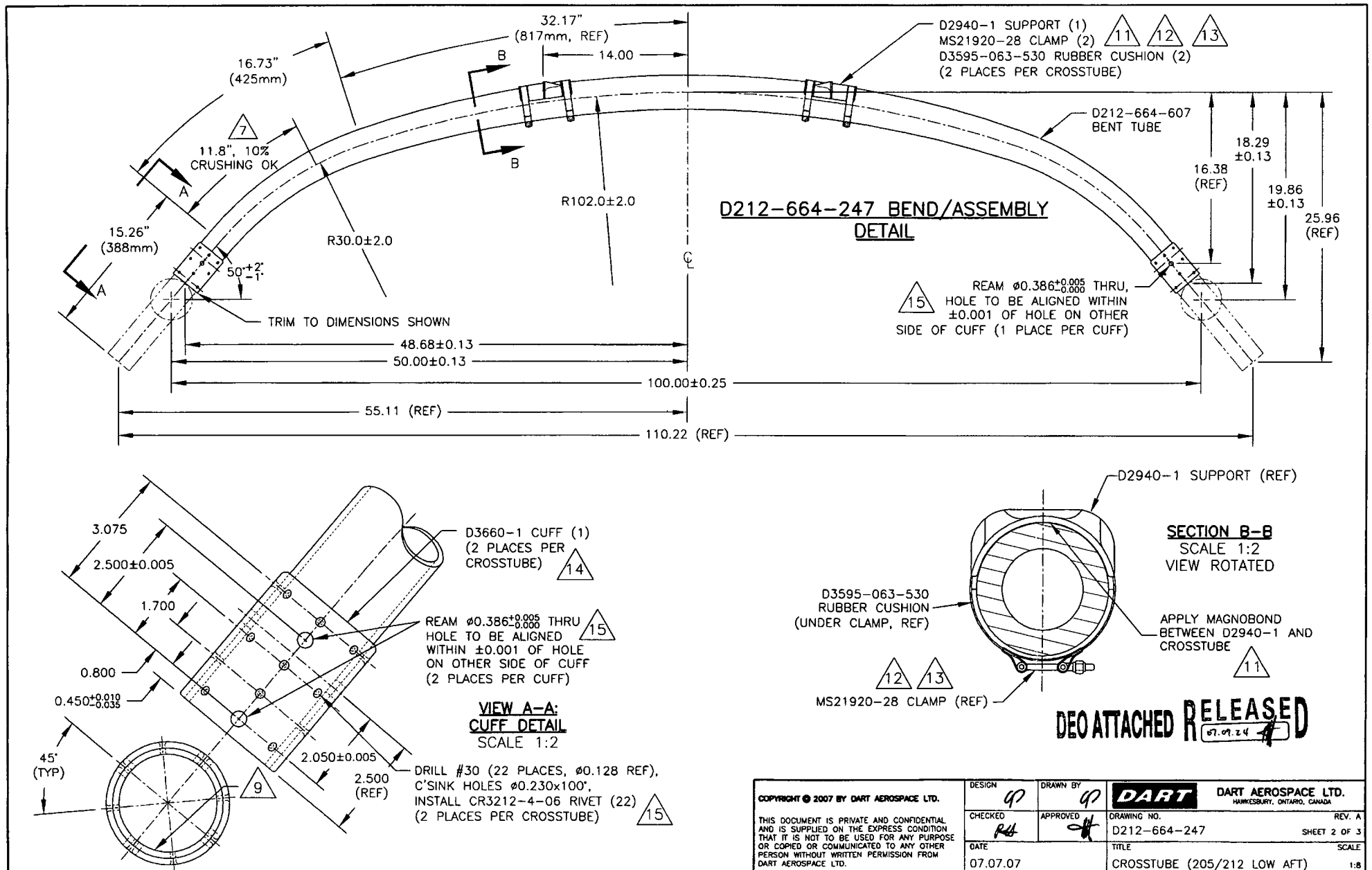
DEO ATTACHED
RELEASED
07.07.07

| | | |
|-------------------|---|--|
| A | 07.07.07 | NEW ISSUE |
| DESIGN <i>qp</i> | DRAWN BY <i>qp</i> | DART DART AEROSPACE LTD. WILKESBORO, ONTARIO, CANADA |
| CHECKED <i>PH</i> | APPROVED <i>PH</i> | DRAWING NO. D212-664-247 REV. A SHEET 1 OF 3 |
| DATE 07.07.07 | TITLE CROSSTUBE (205/212 LOW AFT) SCALE NTS | |

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DART AEROSPACE LTD.

0209/08/20


W/O: 51377



W/O: 5/377



RELEASED
07-01-24
DEO ATTACHED

| | | | | | |
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| | CHECKED | APPROVED | | DRAWING NO. | REV. A |
| | DATE | | | D212-664-247 | SHEET 3 OF 3 |
| | | | | TITLE | SCALE |
| | 07.07.07 | | CROSSTUBE (205/212 LOW AFT) | 1:4 | |

C709108/20
W/O: 51377

| | | | | | | | |
|-----------------------------|----------------------|-------------------------|---|--|--------------------------------|---------------------------|--------------|
| DRAWING NO. D212-664-247 | TITLE CROSSTUBE | REV. A | DART AEROSPACE LTD ENGINEERING ORDER | | D.E.O. NO. D212-664-247-A-1 | SHEET NO. SHEET 1 OF 1 | SCALE NTS |
| DRAWN <i>UP</i> | CHECKED <i>PH</i> | MFG. APPR. <i>AA</i> | APPROVED <i>AMP</i> | | DE APPR. <i>PH</i> | | |
| DATE 09.05.01 | DATE 09.06.15 | DATE 09/06/22 | DATE 09/06/22 | | DATE 09.06.22 | | |

CHANGE:

ADD THE FOLLOWING CROSSTUBE ASSEMBLY:

| Part Number | Description |
|---------------|----------------------------------|
| D212-664-247B | CROSSTUBE ASSEMBLY (214 LOW AFT) |

THE D212-664-247B CROSSTUBE HAS THE SAME PARTS LIST AS THE D212-664-247 CROSSTUBE. HOWEVER, INSTALL THE SUPPORTS AS SHOWN IN FIGURE 1 OF THIS ENGINEERING ORDER. THE NEW KIT IS OTHERWISE ASSEMBLED PER THE D212-664-247 CROSSTUBE.

RELEASED
09/06/22

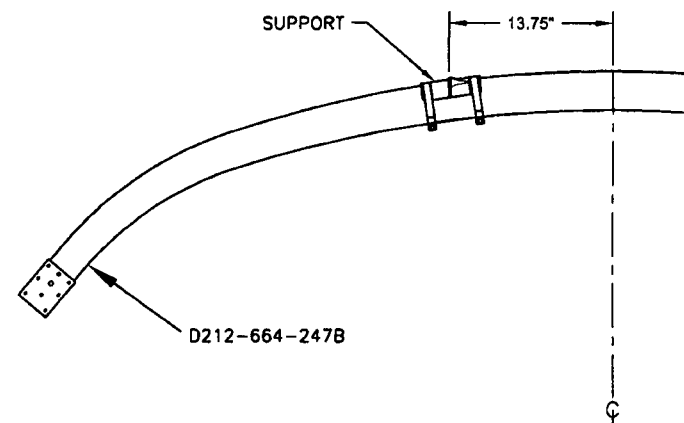


FIGURE 1 - SUPPORT INSTALLATION